#### BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI (MID SEMESTER EXAMINATION)

CLASS: B. TECH BRANCH: PRODUCTION SEMESTER: IV SESSION : SP/2020

FULL MARKS: 25

[2] CO2 BL3

## SUBJECT: PE209 ENGINEERING ECONOMY, COSTING AND ACCOUNTING

## TIME: 2 HOURS

### INSTRUCTIONS:

- 1. The total marks of the questions are 25.
- 2. Candidates may attempt for all 25 marks.

3. Before attempting the question paper, be sure that you have got the correct question paper.

4. The missing data, if any, may be assumed suitably.

# CO BL Q1 (a) What does it mean by economic equivalence? [2] CO1 BL2 Q1 (b) A company planned Bs. 20.00.000 investment in 2012, which is a present worth [3] CO1 BL4

- Q1 (b) A company planned Rs. 20,00,000 investment in 2012, which is a present worth [3] CO1 in the year 2012 of anticipated phase wise investments during the next 4 years from 2013 to 2016. Assume the amount planned for 2013 is Rs. 10,00,000 with constant decrease of Rs. 2,50,000 each year thereafter. Does the planned decreasing investment series equal the announced Rs. 20,00,000 in 2012 using time value of money worth 10%?
- Q2 (a) Differentiate between mutually exclusive alternatives and independent [2] CO1 BL2 projects?
- Q2 (b) An electronic part manufacturing company must choose one of two different [3] CO1 BL4 assembly methods. Method A will cost Rs. 80,000 to buy and will have an annual operating cost of Rs. 6,000 over its 4-year service life. Method B will cost Rs. 1,30,000 initially with an annual operating cost of Rs. 4,000 over its 8-year life. Methods A will have no salvage value, but method B will have some equipment worth an estimated Rs. 12,000. Which method should be selected if the alternatives are exclusive? Use present worth at an interest rate of 15% per year.
- Q3 (a) How do you perform replacement analysis?
  - (b) Machine A has remaining service life of 2 years and its current market value is [3] CO2 BL4 Rs. 3,000. While a new automatic machine B costs Rs. 12,000 has a life of 5 years. Operating cost for machine A is Rs. 4,000 per year, while that of machine B is Rs. 2,000 only. Perform a replacement study by cconsidering 15% interest rate.
- Q4 (a) Explain sinking fund method of calculating depreciation. [2] CO2 BL2
  - (b) The purchase cost of an equipment is Rs. 40,000. It has useful life of 5 years. [3] CO2 BL3 The salvage value at the end of useful life is Rs. 2,000. Calculate the annual depreciation and book value of the equipment at the end of 4th year using sum-of-years-digits method.
- Q5 (a) Differentiate between explicit cost and implicit cost. [2] CO4 BL2
- Q5 (b) Explain with example: Sunk cost, Out-of-pocket cost, and Opportunity cost. [3] CO4 BL2

	n	Compound Amount F/P	Present Worth P/F	Sinking Fund A/F	Compound Amount F/A	Capital Recovery A/P	Present Worth P/A	Gradient Present Worth <i>P</i> /G	Gradient Uniform Series A/G
	1	1.1500	0.8696	1.00000	1.0000	1.15000	0.8696		
	2	1.3225	0.7561	0.46512	2.1500	0.61512	1.6257	0.7561	0.4651
	3	1.5209	0.6575	0.28798	3.4725	0.43798	2.2832	2.0712	0.9071
[	4	1.7490	0.5718	0.20027	4.9934	0.35027	2.8550	3.7864	1.3263
	5	2.0114	0.4972	0.14832	6.7424	0.29832	3.3522	5.7751	1.7228
[	6	2.3131	0.4323	0.11424	8.7537	0.26424	3.7845	7.9368	2.0972
[	7	2.6600	0.3759	0.09036	11.0668	0.24036	4.1604	10.1924	2.4498
[	8	3.0590	0.3269	0.07285	13.7268	0.22285	4.4873	12.4807	2.7813

[Data for Q2 & Q3] Discrete Cash Flow: Compound Interest Factors (at interest rate 15%)